

# OVAL-TRACKED EXERCISE APPARATUS FOR SIMULATING HAND-MOVEMENT

## BACKGROUND OF THE INVENTION

### 5    1. Fields of the Invention

The invention relates to an oval-tracked exercise apparatus for simulating hand-movement, and more particularly, to an apparatus in which the rocker arm and the treadle move synchronously in an oval track and in an offset position for simulating the actual motion of the hands and the feet in an oval track during walking exercise session.

### 2. Description of the Related Art

People work for what they need. Meanwhile, they realize how important their health is. Therefore, they do exercise for keeping their bodies in good condition. The simplest way to exercise is the use of the exercise apparatuses.

15    Among the exercise apparatuses, the oval-tracked exercise apparatus can best simulate the actual walking exercise. US 3, 315, 898 ("Rehabilitation & Exercise Apparatus") teaches that a motor imparts motion to two treadle bars through a belt-driven toothed plate such that the treadle bars move in an offset position. However, it lacks means for keeping the body in balance. Therefore, the operator easily falls from the exercise apparatus due to the instability of his center of gravity.

Another prior art – US 5,242,343 ("Stationary Exercise Device") – teaches that two rocker arms are pivotably connected to the base. The bottom of each

rocker arm and the front end of the treadle bars are joined to each other in a movable state. The other end of the treadle bars is attached to the side of the flywheel. Both of the treadles are alternately treaded to simulate the movement of hands and feet in an oval track. Meanwhile, both rocker arms move in  
5 alternating way to aid the operator in keeping their bodies in balance.

Since the hands of the operators are synchronically movable with the rocker arms to perform the arched, reciprocating motion, this doesn't correspond to the actual coordinating movement of hands and feet during walking session. Due to the non-ergonomic design, the muscle function could be deteriorated, thereby  
10 causing the abnormality of the balance sense.

## SUMMARY OF THE INVENTION

The conventional oval-tracked exercise apparatuses are divided into electric and manual type machines. Their constructions are almost the same, but the  
15 greatest difference lies in that the electrical oval-tracked exercise apparatus utilizes electric motor to drive the toothed disc in rotation while the manual one is operated by continual action of operator's feet to impart motion to a flywheel thereof. The invention can be applied to both the toothed disc of the electrical oval-tracked exercise apparatus and the flywheel of the manual oval-tracked  
20 exercise apparatus. In order to unifying the different terms for them, a rotary body is used hereinafter to stand for these different terms.

An oval-tracked exercise apparatus includes a round rotary body installed at the tail of a main frame and connected with one end of treadles on opposite sides thereof, a rocker arm connected to the other end of the treadle, thus form an

exercise apparatus. A pair of accessory rods inserts through a shaft and connects to treadles. Each of the accessory rods connects to a rocker arm through connecting rods, moves in an oval track and in an offset position. A motor drives a positioning rod for moving an adjusting mechanism composed by pivoted connecting rods and shaft. Therefore, the present invention simulates the treading action of the feet and the swinging action of the hands during the walking on an uphill road, a downhill road or a flat road.

It is a primary object of the invention is to provide an oval-tracked exercise apparatus that enables all of the operator's extremities to locate on the exercise apparatus for simulating the jogging action during the excising session.

A further object of the invention is to provide an oval-tracked exercise apparatus that enables the hands of the operators to move in accordance with the movement of their feet in an oval track such that the operator's health can be improved.

Still another object of the invention is to provide an oval-tracked exercise apparatus with an adjusting mechanism to adjust the angle of the treadle bars for simulating a walking exercise on an uphill road or on a downhill road.

#### BRIEF DESCRIPTION OF THE DRAWINGS

The accomplishment of this and other objects of the invention will become apparent from the following description and its accompanying drawings of which:

Fig.1 is a perspective view of the present invention;

Fig.2 is a rear view of the present invention;

FIG. 3 is a side view of the present invention showing the rear end of a treadle on the left side of a rotary body;

FIG. 4 is a side view of the present invention showing the rear end of a treadle on the bottom side of a rotary body;

5        FIG. 5 is a side view of the present invention showing the rear end of a treadle on the right side of a rotary body;

FIG. 6 is a side view of the present invention showing the rear end of a treadle on the top side of a rotary body;

10       Fig.7 is a schematic drawing showing the action of a connecting mechanism in Fig. 3, 4, 5 and Fig.6;

Fig.8 is a schematic drawing showing the action of an adjusting mechanism in Fig.1.

#### DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

15       Referring to Fig. 1 and Fig. 2, a main frame 11 of the present invention has two first pivots 37. Two first connecting rods 36 are pivoted on the first pivots 37 and connected to a transversely-positioned shaft 35. The shaft 35 is then connected in sequence to a second connecting rod 21, an accessory rod 23 and a positioning rod 33. The positioning rod 33 supports the shaft 35 by connecting to a pivoting member 34 on the bottom thereof. The pivoting member 34 is positioned on a transverse rod 16 and is turnable. A driving member 32 driven by a motor 31 is installed between the positioning rod 33 and the pivoting member 34. In this way, 20       the motor 31 drives the pivoting member 34 to turn clockwise or anti-clockwise at

the transverse rod 16, pulling or pushing the positioning rod 33 to change the position of the shaft 35 within the space limited by the connecting rod 36. The above is called adjusting mechanism 30.

5 The accessory rod 23 turns freely at the shaft 35 at one end and is connected to the treadle 13 at the other end, on which there is a third pivot 26. The second connecting rod 21 also turns freely at the shaft 35 and is connected to the middle of a rocker arm 12 at the other end. The bottom of a rocker arm 12 is connected to a third connecting rod 24, which is pivoted on the connecting member 25 and thus connected to a third pivot 26. Since the design makes the accessory rod 23 and the  
10 rocker arm 12 move together, the above is called connecting mechanism 20.

The treadles 13 are connected to the circumference of a rotary body 14 at the tail of the main frame 11 and are positioned oppositely along the same diameter. In this way, the treadles 13 move in opposite direction, with one up and the other down, or one front and the other back. An enclosure 15 covers the rotary body 14  
15 and other components such as a motor or power equipment (not shown in the figure) to form an exercise apparatus 10.

Meanwhile, the invention has two sides with the same components that are disposed in a staggered way. In order to prevent the illustration of the rocker arm and the accessory rod in a mess, they are shown with only one side.

20 Referring to Fig. 3, as the rear end of the treadle 13 starts at the left side of the rotary body 14, and then the treadle 13 moves and drives the accessory rod 23 connected to the front end of the treadle 13 at the shaft 35, the treadle 13 reaches the suspending position as shown in Fig. 3. Simultaneously, as shown in sample E of Fig. 7, through the third pivot 26, the connecting member 25 and the third

connecting rod 24, the accessory rod 23 drives the rocker arm 12 to reach a fixed position within the range limited by the second connecting rod 21 with the support of the second pivot 22 so that the user can hold the rocker arm 12.

The front end of the treadles 13 is connected to the accessory rod 23, which  
5 can turn round freely. As a given force, such as from the motor in the enclosure 15, drives the rotary body 14 and makes the rear end of the treadles 13 reach the bottom of the rotary body 14, as shown in Fig. 4, the treadles 13 lean at an angle, and the paddle goes to the position of B along the oval track drawn in the figure. At the same time, the third pivot 26, as shown in sample F of Fig. 7, with the driving  
10 effect of the accessory rod 23, drives the connecting member 25 and the third connecting rod 24 simultaneously so that the rocker arm 12 moves within the range limited by the second pivot 22 and the second connecting rod 21, and the handle reaches the position of b along the oval track drawn in the figure.

As shown in Fig. 5, as the rear end of the treadle 13 reaches the right side of the  
15 rotary body 14, the accessory rod 23 connected to the front end of the treadle 13 drives the treadles 13 to reach the position of C along the oval track drawn in the figure. At the same time, the rocker arm 12 is driven by the connecting mechanism 20 comprising the second connecting rod 21, the second pivot 22, the accessory rod 23, the third connecting rod 24, the connecting member 25 and the third pivot  
20 26, so that the handle moves as shown in sample G of Fig. 7, simultaneously and reaches the preset position of c along the oval track drawn in the figure.

With the movement around the circle, as the end of the treadles 13 moves to the top of the rotary body 14, as shown in Fig. 6, and the paddle reaches the position of D along the oval track drawn in the figure, the rocker arm 12 is driven

by the connecting mechanism 20 so that the handles move as shown in sample of H in Fig. 7 simultaneously to the position of d along the oval track.

The rotary body 14 turns round periodically, driving the end of the treadles 13 back to the starting point as shown in Fig. 3, so that the paddle resumes former position of A along the oval track, simultaneously driving the rocker arm 12 and making the handle back to the position as shown in sample E in Fig. 7, equal to the position of a along the oval track.

As the machine is in idle or in exercise, users can choose the altitude for different workout conditions. Refer to sample I of Fig. 8, with the motor 31 of the adjusting mechanism 30 pulling back the driving member 32 in the direction pointed by the arrow, the pivoting member 34 is driven to level up clockwise at the transverse rod 16 and pushes the positioning rod 33 to rise gradually, which supports the shaft 35 to rise to the preset position in the range with the first pivots 37 as the center and the first connecting rod 36 as radius.

On the other hand, as the motor 31 of the adjusting mechanism 30, as shown in sample J of Fig. 8, drives the driving member 32 in the direction pointed by arrow, the pivoting member 34 goes down anti-clockwise, pulls back the positioning rod 33, and drives the shaft 35 to lower down to the original position.

Since the altitude change of the shaft 35 inevitably drives the connecting mechanism 20 pivoted on the shaft 35 and thus changes the original slope of the treadles 13, so as to simulate uphill, downhill, or general workout conditions.

Therefore, the advantages of the invention can be concluded as follows:

1. The use of the oval-tracked exercise apparatus of the invention simulates the movement of the hands and the feet during the session of walking exercise,

unlike that the conventional rocker arms can only perform single arched swing.

2. The simulation of the movement of the hands and the feet in walking exercise will enable the feet to move in an oval track for keeping the operator's health in good condition.
3. The uphill and downhill exercise modes are available by adjusting the adjusting mechanism of the invention.

A further embodiment of the present invention includes the same components as the above embodiment except the adjusting mechanism. One end of the first connecting rod 36 is fixed on the main frame 11 while the other end is connected with the shaft 35. And the shaft 35 is connected to the connecting mechanism 20 such as the second connecting rod 21 and the accessory rod 23 in sequence. Thus the rocker arm 12 and the treadle 13 move synchronously in an oval track and in an offset position.

Many changes and modifications in the above-described embodiments of the invention can, of course, be carried out without departing from the scope thereof. Accordingly, to promote the progress in science and the useful arts, the invention is disclosed and is intended to be limited only by the scope of the appended claims.